

100% RES or CES Technical Analysis – draft Scope of Work

CEP and CAP Considerations

The 2022 Vermont Comprehensive Energy Plan (CEP) and 2021 Climate Action Plan recommend consideration of a 100% Clean or 100% Renewable Energy Standard (CES or RES), to expand upon the current requirement for 75% renewable electricity by 2032. The CEP recommended that any analysis of potential changes to the RES and related renewables programs and policies (e.g., net-metering, Standard Offer) should consider (p. 269):

- Equity: Impacts of current and proposed programs on frontline communities; how the benefits and burdens of policies are distributed.
- Cost-effectiveness: Modifications to programs should closely consider costs and benefits.¹ If there are more affordable mechanisms to meet Vermont’s energy service needs, they should be closely considered. Cost-effectiveness, in terms of dollar per desired output, can be measured a number of ways (e.g., carbon, energy provided, capacity provided, etc.). Policies and programs must be aware of any upward rate pressure that could discourage the economic proposition for customers to electrify.²
- Carbon reduction: The amount of carbon reduction acquired relative to alternative resources.
- Grid impact: Does the policy or program address time and locational value (or cost) of resources?
- Economic development impacts: How does the policy or program impact economic development?
- Uncertainty/flexibility: Does the policy or program stand up well to uncertainties and does it include mechanisms to react to changes over time?
- Simplicity: Is the policy/program understandable and implementable?

Stakeholder-Proposed Design Elements

Various elements of an expanded RES have been proposed by stakeholders in recent years. These include (but are not limited to):

- Expanding Tier I to 100% renewable or carbon-free electricity
- Expanding Tier II to 20% or 30% by a date certain – for example 2032-2035
- Expanding Tier II to include all existing VT renewables, regardless of vintage or size
- Adding a locational component to minimize grid expansion costs
- Adding a time element (hourly, seasonal) to align with demand, contain costs, and increase impact on emissions

¹ As discussed in Chapter 2 of the 2022 Vermont Comprehensive Energy Plan, costs and benefits must be transparent and articulated at least several levels: societal, Vermont-specific, and for electric ratepayers.

² Costs (and benefits) should be comprehensive and inclusive of both compliance costs as well as additional costs and benefits attributable to implementation of each scenario (for example, inclusive of the so-called omitted costs discussed on slide 38 of: https://eta-publications.lbl.gov/sites/default/files/rps_status_update-2021_early_release.pdf)

- Adding a new regional renewables tier, where utilities would be required to retire attributes from new facilities in New England or that may be imported into New England
- Allowing in-state LIHI-certified hydro facilities to count for Tier II
- Measuring based on total electrical energy requirements, not just retail sales
- Limiting the volume of HQ RECs that can be used to meet Tier I
- Limiting the ability of RECs to be purchased “unbundled” without associated energy

Required Analysis

The Department is seeking a consultant to assist in the technical evaluation of moving to a 100% CES or RES, taking into consideration the recommendations in the CEP and CAP, the scenarios above as well as others that will be brought forward in the [RES engagement work](#) the Department is currently undertaking, the state environmental justice policy as described in Act 154 of 2022, and state energy policy expressed in Title 30 of the Vermont Statutes Annotated, in particular Title 30, Section 202a, requiring that, to the greatest extent practicable, that Vermont can meet its energy service needs:

- In a manner that is adequate, reliable, secure, and sustainable
- Ensuring affordability and encouraging the state’s economic vitality
- Using energy resources efficiently and managing demands cost effectively
- In a manner that will achieve greenhouse gas reductions requirements

Scenarios for Analysis

In light of the above, the consultant will evaluate approximately six scenarios for electricity procurement. The scenarios should reflect stakeholder input as well as the CEP, CAP, and state energy policy in 30 V.S.A. § 202a, and that ideally reflect a “best case” balancing of affordability, sustainability, reliability, equity, and economic development. The scenarios should be evaluated relative to a Business-as-Usual baseline reflecting the current Renewable Energy Standard and supporting programs (e.g., net-metering). The base six scenarios are:

1. 100% Renewable Tier I requirement by 2032 including 20% or 30% Tier II
2. 100% Clean requirement by 2032 including 20% or 30% Tier II
3. Adding a new requirement for utilities to purchase renewable energy from new facilities in New England or that may be imported into New England
4. Requiring compliance on a more granular time basis than hourly (time interval TBD based on contractor and stakeholder input (for example, quarterly, seasonally or hourly compliance).
5. Scenario 5 TBD by Stakeholder Advisory Group
6. Scenario 6 TBD by Stakeholder Group

Considerations: Vermont’s RES includes a Tier III energy transformation component; however, this analysis will primarily focus on energy procurement/supply scenarios (currently Tiers I and II). The current RES is based on annual retail sales (i.e., not including losses) and compliance is measured annually. As vertically integrated utilities, Vermont distribution utilities can sign long-term bundled contracts which also impact energy, capacity, transmission, and other power sector costs and benefits at a more granular level (e.g., hourly). The consultant must consider the fact that the environmental attributes (RECs) are not the only product purchased in bundled contracts and the costs and benefits of these other products impact the overall cost of the RES.

The consultant should be prepared to analyze certain sensitivities to scenarios. These sensitivities would be smaller variations to individual scenarios – for instance: changing the compliance date from 2032 to 2030 or 2035; modifying the amount of load that needs to be served by renewable or clean resources; modifying the eligibility of certain technologies; modifying the eligibility date for new resources; placing restrictions on locations of new renewable energy in Vermont; or optimizing the timing of generation through time-shifting of generation resources or load through energy storage or other load management measures.

Respondents to this scope of work may propose scenarios and sensitivities for analysis and consideration by the PSD and stakeholders.

Scenario Evaluation – Methods and Metrics

The consultant will propose methods of quantitative analysis and metrics to answer at least the following questions, and additional questions that may arise through the stakeholder process:

- Cost-effectiveness
 - Total Vermont and broad electric sector cost/benefit impacts relative to baseline (\$) and rate impact (%) inclusive of:
 - Environmental attributes/regulatory compliance cost
 - Underlying energy and capacity
 - Transmission and distribution
- Carbon reduction
 - Tons of CO₂ equivalent reduced
 - Value of avoided emissions (priced at the social cost of carbon)
- Intra-year renewability
 - Average % renewability
 - Peak % renewability
 - Lowest % renewability
- Grid impact
 - Distribution and transmission costs and benefits
 - Reliability and resilience impacts³
- Other economic and environmental impacts
 - State GDP
 - Net employment
 - Land use including environmental justice impacts

Considerations: The Department is interested in consultant proposals on how best to quantify the above-listed impacts across selected scenarios based on prior experience and industry best practice analyzing state renewable procurement policies.

³ Reliability is defined for purposes of this scope of work “foundationally, about avoiding ‘loss of load’ (or power outages), both in number and duration, during day-to-day operations....resilience is usually thought of in terms of a specific, low-probability, high-impact event.” A reliable grid can manage local, short-duration (< 24 hours) events, while a resilient one can manage > 24-hour events with widespread geographic footprints including “major events” under IEEE 1366. ([Vermont 2022 Comprehensive Energy Plan](#), pp.90-91. See also [Modern Distribution Grid Report, Volume IV](#), US Department of Energy).

In addition, CES or RES requirements can be achieved through multiple procurement types (e.g., utility PPAs, centralized statewide reverse auction, customer-facing programs such as net energy metering or billing), the design and relative contribution of which is a key contributor to various costs and benefits. The consultant should include a component of the scenario analysis devoted to evaluation of the important aspects of procurement programs and other policies to realize the “best case” of each scenario analyzed (e.g., are 100% of resources obtained to meet obligations assumed to be procured at least cost? Is flexible load management maximized?), and this evaluation should be reflected in the proposed metrics. This should include at least high-level recommendations for cost-allocation and other considerations to enhance equity. The procurement program discussion should also highlight elements of programs and other policies that reduce uncertainty, provide flexibility, and simplify implementation.

Deliverables

1. Publicly accessible, Excel-based model used to analyze scenarios, to become the property of the Public Service Department, and which the Department can also use going forward to model RES costs and benefits on an annual basis.
2. Draft (by September 15, 2023) and final (by November 1, 2023) reports summarizing key assumptions, variables, methodology, stakeholder input, and results of the analysis.
3. Recommendation for “best case” scenario (and supporting programs or policies) to maximize affordability, sustainability, reliability, resilience, equity, and economic development.

Stakeholder Engagement

The Public Service Department will be both the point of contact for the contractor and the project manager for this contract. At each stage of assumption development and draft results, the PSD will convene a Stakeholder Advisory Group for review and input⁴; the contractor should plan to attend these meetings, present assumptions and results, and incorporate input as may be appropriate. All changes should be reviewed with the PSD.

Timeline

Respondents to the RFP may propose modifications to the timeline and Task details; deviations should be clearly identified. Respondents should provide proposed dates for completion of Tasks, with a target date of **November 1** for a final report. Respondents should provide a detailed proposed timeline.

Task 1: Kick-off Meeting with State Staff, Kick-off with Stakeholders

- Hold Virtual Kick-off meeting with PSD to go over project objectives and goals with state staff to ensure common understanding.
- Hold Virtual Kick-off meeting with Stakeholder Advisory Group to provide overview and to help shape final scope of study, including scenarios and sensitivities.
- Provide Revised scope and work plan for PSD, and for Stakeholder Advisory Group review
- Provide Final Scope and Work Plan.

Task 2: Scenario Development

⁴ At the time of writing, the Vermont General Assembly is considering a bill that would formalize a stakeholder Advisory Group.

- Provide key assumptions for review by PSD, and by Stakeholder Advisory Group.
- Work with PSD and Stakeholder Advisory Group to determine final scenarios for analysis, as well as key sensitivities to analyze.

Task 3: Scenario Evaluation

- Provide draft results to PSD for review and feedback.
- Modify based on feedback.
- Provide draft results to Stakeholder Advisory Group and at a public workshop.
- Modify based on feedback.
- Provide Final Results.

Task 4: Provision of Model and Associated Training

- Provide excel-based modeling tool to PSD, as well as training session so that PSD may use the tool for future analysis. Tool must not be proprietary or confidential in nature.

Task 5: Presentation of Results

- Be available following final results for 1-2 presentations.